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ABSTRACT

To compile a list of activities and achievements considered as creative by laymen, 239 graduate and undergraduate students named their three most creative accomplishments and activities in each of six areas: mathematics and science; music; fine arts; performing arts; literature; and miscellaneous. This resulted in a 198-item list, which was rated from 1 (least creative) to 11 (most creative) by another group of 50 college students. Ninety items were retained--those with a mean creativity rating of over 5.7, and those with a standard deviation below 2.7 (indicating reliability of judges ratings). The number of times the activity occurred during adolescence and adulthood was rated, with the exclusion of activities required as part of required school coursework. Six subscales were identified: fine arts; crafts; literature; music; performing arts; and mathematics-science. Internal consistency reliability ranged from .63 to .89. Three subscales and fifteen miscellaneous items did not meet the standards for reliability and discriminant validity. (Each subscale and the 90-item inventory are appended.) (GDC)

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The Development of the Creative Behavior Inventory (CBI)

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An earlier version of this paper was presented at the 1979 meeting of the Rocky Mountain Psychological Association.

The Development of the Creative Behavior Inventory (CBI)

Among the many problems associated with the identification of creative talent is the problem of selecting appropriate criteria of creativity. Some of the shortcomings of commonly used criteria have been reviewed by Yamamoto (1965), and Hocevar (1978) and the current lack of appropriate criteria is still discussed by experts (Treffinger, Renzulli & Feldhusan, 1971; Treffinger & Poggio, 1972; Dellas & Gaier, 1970). Despite this problem, research devoted to the identification of criteria of creativity is rare, and a majority of the studies done in the area of creativity do not investigate this issue. The purpose of the present study was to first identify activities and achievements which are considered creative by the layman, and then to develop a creative behavior inventory around these activities and achievements.

METHOD

Subjects.--The 239 subjects (129 females, 110 males) used in this study included 99 students from an introductory psychology course and 140 students from two educational psychology courses. The breakdown by class was 43 freshmen, 39 sophomores, 69 juniors, 64 seniors, and 24 graduate students.

Scales.--The criterion measure of creativity developed for this study was suggested by earlier attempts at listing creative activities and accomplishments (Wallach & Wing, 1969; Torrance, 1969; Erikson, 1966, and Holland & Nichols, 1964). These attempts were basically intuitive; the consequence being brief lists which were not empirically based.

In order to remedy the problem of generating a large item pool, the

students in the two educational psychology courses were asked to list their three most creative activities and accomplishments in each of six areas: mathematics and science, music, fine arts, performing arts, literature and a miscellaneous category. From these listings, an initial item pool of 198 creative activities and accomplishments was subjectively constructed.

A scaling study was conducted to provide an empirical basis for the further refinement of the item pool. Fifty introductory psychology students (different from those used in the rest of this study) were asked to rate each activity and accomplishment on a continuum ranging from 1 (least creative) to 11 (most creative). The reliability of the judges' ratings, calculated as recommended by Ebel (1951), was equal to .96.

The mean value of each item's rating was taken to locate that item on a hypothetical continuum ranging from less creative activity and achievement to more creative activity and achievement. The standard deviation of the judges' ratings was taken as a measure of the interjudge consensus on a particular item. These two statistics provided a standard for further elimination of items. Items with a mean creativity rating of 5.7 (28th percentile) and below were eliminated along with items with a standard deviation of 2.7 (85th percentile) or greater. In addition, items which met these standards were also considered for elimination depending on their potential usefulness in the inventory.

One hundred and eight items were eliminated. The remaining 90 items were administered as an inventory. Eighty-two of the 90 items were presented in the following format:

(1) Received an award for acting

(a) never (b) once or twice (c) 3-5 times (d) more than 5 times

The remaining 8 items were similar in format except that "years" was substituted

for "times" in four items dealing with playing a musical instrument and "organizations" was substituted for "times" in four items dealing with participation in organizations related to creative activity. When deemed appropriate, the parenthetical statement "excluding school or university coursework" was included with the item. The purpose of this addition was to exclude activities that were not self-motivated. Subjects were asked to consider only creative activities and achievements that occurred in their adolescent and adult life. An item score was based on response category--zero points for never, one point for once, two points for 3-5, and 3 points for more than 5.

After administering the scale to the sample of 239 college students, standard item analysis procedures were used to establish the scale's dimensionality. Sixty-seven of the 90 items were intuitively divided among six subscales: creativity in the fine arts, crafts, literature, music, performing arts, and a math-science category. All ninety items were correlated with each scale. Correlations were corrected for the spurious increase that results when an item is correlated with a composite that includes that item. For an item that was initially put into one of the six subscales, the standard for elimination from that subscale was an item/total correlation of less than .20 with its own subscale, or an item/total correlation that was not at least .10 greater than its item/total correlation with any other subscale. The purpose of these two comparisons was to guarantee reliability and discriminant validity, respectively. Items which were not originally connected to a specific subscale were added to the subscale which had the highest correlations with that item, provided that the standards for reliability and discriminant validity were met. This analysis was repeated a second time after items were added and deleted from subscales. After the second

item analysis, four exceptions to the standards were made in cases where an item's subscale was intuitively obvious, and it was believed that an item's poor item statistics were an artifact of the sample. Coefficient alpha (Cronbach, 1951) a reliability measure based on the internal consistency of the test, was computed for each scale with the following results: .81 for fine arts, .84 for the performing arts, .63 for math-science, .89 for crafts, .80 for literature and .74 for music.

RESULTS AND DISCUSSION

Three of the subscales are shown in Table I.

Insert Table I here.

Creativity in literature consists of 14 items which deal with literary production, publication and involvement. The 12-item music scale includes items which refer to the original production of music and to musical performance. The 19-item craft scale covers a large variety of crafts.

The remaining three scales and a list of items which did not meet the standards for reliability or discriminant validity are shown in Table II.

Insert Table II here.

Creativity in the fine arts is a 8-item scale which primarily deals with activity and achievement with graphic media. The math-science scale has 5 math items and 5 science items. The 12-item performing arts scale generally refers to two areas: creativity in dance and creativity in drama. In Table II, nonscalable items are listed in a nonscalable category.

In conclusion, the activities and achievements measured by the creative behavior inventory demand expertise and are recognized by society as being creative.

However, with a few exceptions, this approach to identifying creativity has not been used in the literature. If a researcher's goal is the identification of creative people, the activities and achievements approach may prove to be more advantageous than many published and unpublished tests in that it is a direct measure of creativity rather than an assumed correlate of creativity. It is recognized that the inventory would have to be modified to accommodate different populations, but the general approach is applicable to a variety of situations. A more detailed review of the advantages of the activities and achievements approach in comparison to nine other approaches to measuring creativity (e.g. divergent thinking, judgments of products, personality inventories, etc.) is given in Hocevar (1978).

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Table 1 8

Activities and Accomplishments Rated as Highly Creative

in Literature, Music and the Crafts

Literature

1. Worked as an editor for a newspaper or similar organization
2. Worked as an editor for a school or university literary publication
3. Founded a literary magazine or similar publication
4. Had a piece of literature (e.g. poem, short story, etc.) published in a school or university publication
5. Wrote poetry
6. Wrote the lyrics to a song
7. Had a piece of literature (e.g. poem, short story, etc.) published (not in a school or university publication)
8. Wrote clever or humorous letters
9. Started but did not finish a novel
10. Wrote and completed a novel
11. Won an award for some achievement in literature
12. Participated in a writers' workshop, club, or similar organization
13. Wrote a short story
14. Wrote something humorous such as jokes, limericks, satire, etc.

Music

1. Gave a music recital
2. Wrote music for one instrument
3. Wrote music for several instruments
4. Cut a record
5. Won an award for musical accomplishments
6. Was a participating member of a symphony orchestra
7. Entered a contest as a musician
8. Had original music published or publically performed
9. Played a percussion instrument (including piano) with a reasonsable degree of proficiency
10. Played a brass instrument with a reasonable degree of proficiency
11. Played a string instrument with a reasonable degree of proficiency
12. Played a wind instrument with a reasonable degree of proficiency

Crafts

1. Made a craft out of metal
2. Made candles
3. Designed and made your own greeting cards
4. Built a hanging mobile
5. Constructed and put on a puppet show
6. Received an award for making a craft
7. Made a craft out of plastic, plexiglass, stained glass, or a similar material
8. Made a leather craft
9. Made a ceramic craft
10. Designed and made a piece of clothing
11. Cooked an original dish
12. Prepared an original floral arrangement
13. Made jewelry
14. Planned and kept a garden
15. Designed and constructed a craft out of wood
16. Designed and made a costume
17. Participated in a craft workshop
18. Made your own holiday decorations
19. Knitted or crocheted something

Table 2

Activities and Accomplishments Rated as Highly Creative in Art, Math and Science, the Performing Arts, and a Nonscalable Category

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Art

1. Painted an original picture
2. Made a sculpture
3. Received an award for artistic accomplishment
4. Made cartoons
5. Drew a picture for aesthetic reasons
6. Had artwork published in a school or university publication
7. Had artwork published (not in a school or university publication)
8. Kept a sketch book

Math and Science

1. Constructed something that required scientific knowledge such as a radio, telescope, scientific apparatus, etc.
2. Presented an original mathematics paper to a professional or special interest group
3. Had a mathematics paper published
4. Developed a design for a scientific experiment
5. Entered a project or paper into a science contest
6. Applied math in an original way to solve a practical problem
7. Wrote an original computer program
8. Won an award for a scientific project or paper
9. Entered a mathematical paper or project into a contest
10. Had a scientific paper published

Performing Arts

1. Received an award for acting
2. Received an award for performance in modern dance or ballet
3. Received an award for performance in popular dance
4. Choreographed a dance
5. Put on a radio show
6. Performed ballet or modern dance in a show or contest
7. Assisted in the design of a set for a dramatic production
8. Had a role in a dramatic production
9. Entered a contest as a singer
10. Directed or managed a dramatic production
11. Participated in a drama workshop, club or similar organization
12. Participated in a dance workshop, club or similar organization

Nonscalable

1. Entered a speech contest
2. Wrote a play
3. Planned and presented an original speech
4. Took and developed your own photographs
5. Designed a game
6. Directed or organized a political group
7. Performed on television
8. Made or helped make a film or videotape
9. Made a musical instrument
10. Helped design a float
11. Planned and directed a school or community event
12. Won an award for speech and debate
13. Wrote a play which was given in a public performance
14. Made up magic tricks
15. Had artwork or craftwork publically exhibited

CREATIVE BEHAVIOR INVENTORY

Instructions

This is an inventory, not a test. The inventory is simply a list of activities and accomplishments that are commonly considered to be creative. For each item, circle the answer that best describes the frequency of the behavior in your adolescent and adult life. Be sure to answer every question.

1. Received an award for acting
(a) never (b) once or twice (c) 3-5 times (d) more than 5 times

2. Worked as an editor for a school or university literary publication
(a) never (b) once or twice (c) 3-5 times (d) more than 5 times

3. Worked as an editor for a newspaper or similar organization
(a) never (b) once or twice (c) 3-5 times (d) more than 5 times

4. Constructed something that required scientific knowledge such as a radio, telescope, scientific apparatus, etc. (excluding school or university course work)
(a) never (b) once or twice (c) 3-5 times (d) more than 5 times

5. Painted an original picture (excluding school or university course work)
(a) never (b) once or twice (c) 3-5 times (d) more than 5 times

6. Entered a speech contest
(a) never (b) once or twice (c) 3-5 times (d) more than 5 times

7. Designed and made your own greeting cards
(a) never (b) once or twice (c) 3-5 times (d) more than 5 times

8. Gave a recital
(a) never (b) once or twice (c) 3-5 times (d) more than 5 times

9. Presented an original mathematics paper to a professional or special interest group
(a) never (b) once or twice (c) 3-5 times (d) more than 5 times

10. Founded a literary magazine or similar publication
(a) never (b) once or twice (c) 3-5 times (d) more than 5 times

11. Made a craft out of metal (excluding school or university course work)
(a) never (b) once or twice (c) 3-5 times (d) more than 5 times

12. Made candles
(a) never (b) once or twice (c) 3-5 times (d) more than 5 times

13. Knitted or crocheted something (excluding school or university course work)
(a) never (b) once or twice (c) 3-5 times (d) more than 5 times

14. Put on a puppet show
(a) never (b) once or twice (c) 3-5 times (d) more than 5 times

15. Made your own holiday decorations
(a) never (b) once or twice (c) 3-5 times (d) more than 5 times

16. Built a hanging mobile (excluding school or university course work)
(a) never (b) once or twice (c) 3-5 times (d) more than 5 times

17. Received an award for performance in modern dance or ballet
(a) never (b) once or twice (c) 3-5 times (d) more than 5 times

18. Received an award for performance in popular dance
(a) never (b) once or twice (c) 3-5 times (d) more than 5 times

19. Had a mathematics paper published
(a) never (b) once or twice (c) 3-5 times (d) more than 5 times

20. Made a sculpture (excluding school or university course work)
(a) never (b) once or twice (c) 3-5 times (d) more than 5 times

21. Had original music published or publically performed
(a) never (b) once or twice (c) 3-5 times (d) more than 5 times

22. Had a piece of literature (e.g., poem, short stories, etc.) published in a school or university publication
(a) never (b) once or twice (c) 3-5 times (d) more than 5 times

23. Developed an experimental design (excluding school or university course work)
(a) never (b) once or twice (c) 3-5 times (d) more than 5 times

24. Wrote poems (excluding school or university course work)
(a) never (b) once or twice (c) 3-5 times (d) more than 5 times

25. Wrote a play (excluding school or university course work)
(a) never (b) once or twice (c) 3-5 times (d) more than 5 times

26. Entered a project or a paper into a science contest
(a) never (b) once or twice (c) 3-5 times (d) more than 5 times

27. Received an award for an artistic accomplishment
(a) never (b) once or twice (c) 3-5 times (d) more than 5 times

28. Received an award for making a craft
(a) never (b) once or twice (c) 3-5 times (d) more than 5 times

29. Made a craft out of plastic, plexiglass, stained glass or a similar material (excluding school or university course work)
(a) never (b) once or twice (c) 3-5 times (d) more than 5 times

30. Made cartoons
(a) never (b) once or twice (c) 3-5 times (d) more than 5 times

31. Made a leather craft (excluding school or university course work)
(a) never (b) once or twice (c) 3-5 times (d) more than 5 times

32. Made a ceramic craft (excluding school or university course work)
(a) never (b) once or twice (c) 3-5 times (d) more than 5 times

33. Wrote music for one instrument (excluding school or university course work)
(a) never (b) once or twice (c) 3-5 times (d) more than 5 times

34. Wrote music for several instruments (excluding school or university course work)
(a) never (b) once or twice (c) 3-5 times (d) more than 5 times

35. Designed and made a piece of clothing (excluding school or university course work)
(a) never (b) once or twice (c) 3-5 times (d) more than 5 times

36. Cooked an original dish
(a) never (b) once or twice (c) 3-5 times (d) more than 5 times

37. Prepared an original floral arrangement
(a) never (b) once or twice (c) 3-5 times (d) more than 5 times

38. Applied math in an origianl way to solve a practical problem (excluding school or university course work)
(a) never (b) once or twice (c) 3-5 times (d) more than 5 times

39. Wrote an original computer program (excluding school or university course work)
(a) never (b) once or twice (c) 3-5 times (d) more than 5 times

40. Drew a picture for aesthetic reasons (excluding school or university course work)
(a) never (b) once or twice (c) 3-5 times (d) more than 5 times

41. Wrote the lyrics to a song (excluding school or university course work)
(a) never (b) once or twice (c) 3-5 times (d) more than 5 times

42. Choreographed a dance (excluding school or university course work)
(a) never (b) once or twice (c) 3-5 times (d) more than 5 times

43. Wrote a short story (excluding school or university course work)
(a) never (b) once or twice (c) 3-5 times (d) more than 5 times

44. Wrote something humorous such as jokes, limeriks, satire, etc. (excluding school or university course work)
(a) never (b) once or twice (c) 3-5 times (d) more than 5 times

45. Planned and presented an original speech (excluding school or university course work)
(a) never (b) once or twice (c) 3-5 times (d) more than 5 times

46. Make jewelry (excluding school or university course work)
(a) never (b) once or twice (c) 3-5 times (d) more than 5 times

47. Cut a record
(a) never (b) once or twice (c) 3-5 times (d) more than 5 times

48. Put on a radio show
(a) never (b) once or twice (c) 3-5 times (d) more than 5 times

49. Had a piece of literature (e.g., poem, short story, etc.) published (not in a school or university-related publication)
(a) never (b) once or twice (c) 3-5 times (d) more than 5 times

50. Took and developed your own photographs (excluding school or university course work)
(a) never (b) once or twice (c) 3-5 times (d) more than 5 times

51. Performed ballet or modern dance in a show or contest
(a) never (b) once or twice (c) 3-5 times (d) more than 5 times

52. Had art work or craft work publically exhibited
(a) never (b) once or twice (c) 3-5 times (d) more than 5 times

53. Won an award for musical accomplishments
(a) never (b) once or twice (c) 3-5 times (d) more than 5 times

54. Wrote clever or humorous letters
(a) never (b) once or twice (c) 3-5 times (d) more than 5 times

55. Designed a game
(a) never (b) once or twice (c) 3-5 times (d) more than 5 times

56. Directed or organized a political group
(a) never (b) once or twice (c) 3-5 times (d) more than 5 times

57. Won an award for a scientific project or paper
(a) never (b) once or twice (c) 3-5 times (d) more than 5 times

58. Performed on television
(a) never (b) once or twice (c) 3-5 times (d) more than 5 times

59. Assisted in the design of a set for a musical or dramatic production (excluding school or university course work)
(a) never (b) once or twice (c) 3-5 times (d) more than 5 times

60. Had art work published in a school or university publication
(a) never (b) once or twice (c) 3-5 times (d) more than 5 times

61. Had a role in a dramatic production (excluding school or university course work)
(a) never (b) once or twice (c) 3-5 times (d) more than 5 times

62. Had art work published (not in a school or university-related publication)
(a) never (b) once or twice (c) 3-5 times (d) more than 5 times

63. Started but did not finish a novel (excluding school or university course work)
(a) never (b) once or twice (c) 3-5 times (d) more than 5 times

64. Wrote and completed a novel (excluding school or university course work)
(a) never (b) once or twice (c) 3-5 times (d) more than 5 times

65. Made or helped make a film or video tape (excluding school or university course work)
(a) never (b) once or twice (c) 3-5 times (d) more than 5 times

66. Made a musical instrument
(a) never (b) once or twice (c) 3-5 times (d) more than 5 times

67. Helped design a float
(a) never (b) once or twice (c) 3-5 times (d) more than 5 times

68. Won an award for some achievement in literature
(a) never (b) once or twice (c) 3-5 times (d) more than 5 times

69. Entered a mathematical paper or project into a contest
(a) never (b) once or twice (c) 3-5 times (d) more than 5 times

70. Had a scientific paper published
(a) never (b) once or twice (c) 3-5 times (d) more than 5 times

71. Planned and kept a garden
(a) never (b) once or twice (c) 3-5 times (d) more than 5 times

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72. Kept a sketch book (excluding school or university course work)
(a) never (b) once or twice (c) 3-5 times (d) more than 5 times

73. Was a participating member of a symphony orchestra
(a) never (b) once or twice (c) 3-5 times (d) more than 5 times

74. Entered a contest as a singer
(a) never (b) once or twice (c) 3-5 times (d) more than 5 times

75. Entered a contest as a musician
(a) never (b) once or twice (c) 3-5 times (d) more than 5 times

76. Designed and constructed a craft out of wood (excluding school or university course work)
(a) never (b) once or twice (c) 3-5 times (d) more than 5 times

77. Planned and directed a school or community event
(a) never (b) once or twice (c) 3-5 times (d) more than 5 times

78. Won an award for speech and debate
(a) never (b) once or twice (c) 3-5 times (d) more than 5 times

79. Wrote a play which was given in a public performance
(a) never (b) once or twice (c) 3-5 times (d) more than 5 times

80. Directed or managed a dramatic production
(a) never (b) once or twice (c) 3-5 times (d) more than 5 times

81. Designed and made a costume
(a) never (b) once or twice (c) 3-5 times (d) more than 5 times

82. Made up magic tricks
(a) never (b) once or twice (c) 3-5 times (d) more than 5 times

83. Played an instrument (percussion, including piano) with a reasonable degree of proficiency
(a) never (b) one or two years (c) 3-5 years (d) over 5 years

84. Played an instrument (string) with a reasonable degree of proficiency
(a) never (b) one or two years (c) 3-5 years (d) over 5 years

85. Played an instrument (brass) with a reasonable degree of proficiency
(a) never (b) one or two years (c) 3-5 years (d) over 5 years

86. Played an instrument (wind) with a reasonable degree of proficiency
(a) never (b) one or two years (c) 3-5 years (d) over 5 years

87. Participated in a drama workshop, club or similar organization (excluding school or university course work)
(a) never (b) one or two organizations (c) 3-5 organizations (d) more than 5 organizations

88. Participated in a craft workshop, club or similar organization (excluding school or university course work)
(a) never (b) one or two organizations (c) 3-5 organizations (d) more than 5 organizations

89. Participated in a writers' workshop, club or similar organization (excluding school or university course work)
(a) never (b) one or two organizations (c) 3-5 organizations (d) more than 5 organizations

90. Participated in a dance workshop, club or similar organization (excluding school or university course work)
(a) never (b) one or two organizations (c) 3-5 organizations (d) more than 5 organizations